

What is claimed is:

1. An apparatus for three-dimensional anaerobic exercise comprising:

- 5 an I-shaped base frame (2);
a tower (3) mounted on the top surface of the I-shaped base frame (2);
a seat (4) mounted on the base frame (2);
handle linkages (5) each inclinedly mounted at right and
10 left sides of the base frame (2) via bearings (6) in such a manner as to form an angle α in front of the seat (4), to perform an angular motion back and forth;
a bearing box (7) mounted on the front end of the handle linkage (5);
15 first and second handle frames (8, 9) rotatably mounted on a handle shaft (10), the first handle frame (8) being connected to the handle shaft (10), the second handle frame (9) being connected to the handle shaft (10) at an angle Θ ;
a handle side lever (11) fixed between the first handle
20 frame (8) and the bearing box (7) in such a manner as to form a predetermined angle with respect to the first handle frame (8);
and an auxiliary linkage (12) connected at an upper end to the handle side lever (11) via a ball joint (13) and mounted at lower end on a fixed lever (14) fixed to the lower end of the
25 front side of the base frame (2) via a ball joint (13a) to form a distance (d).

2. The apparatus for three-dimensional anaerobic exercise according to claim 1, wherein the handle linkages (5)

are axially mounted on the base frame (2) at angles α and α' for trapezoidally angular motion of the right and left directions,

the auxiliary linkage (12) is connected to the fixed lever (14) via the ball joint (13a) in front of or behind the lower portion of the handle linkage (5) on the base frame (2) and is separated from the handle linkage (5) at the predetermined distance (d),

the ball joints (13, 13a) located on the upper and lower portions of the auxiliary linkage (12) are arranged in a perpendicular direction to each other,

the bearing box (7) is fixedly mounted to the lower end of the handle linkage (5) so that the handle shaft (10) is axially mounted to the bearing box (7) at an angle of β or β' ,

the first handle frame (8) is fixed to the handle shaft (10) axially mounted to the bearing box (7), and the second handle frame (9) is connected to the handle shaft (10) at the angle Θ in such a manner as to adjust an angle of a handle (15) or to mount two or more handles (15),

the handle side lever (11) is fixed between the bearing box (7) and the first handle frame (8) mounted on the handle shaft (10) to form a predetermined angle with respect to the first handle frame (8), and

the handle side lever (11) is connected to the auxiliary linkage (12) via the ball joint (13), and performs an angular motion in a direction similar to the direction of an angular motion of the handle shaft (10) for a smooth angular motion of the ball joint (13).

3. The apparatus for three-dimensional anaerobic

exercise according to claim 1, wherein the handle side lever (11) and the fixed lever (14) are connected to the ball joints (13, 13a) via a damper (16), and the damper (16) has a screw adjusting part (17), which is adjusted by male and female screws, 5 to control a range of the angular motion of the handle (15).

4. The apparatus for three-dimensional anaerobic exercise according to claim 1, wherein upper and lower bearing boxes (7) are mounted on the upper end portion of the handle linkage (5), a spur gear (19) is axially fixed to the handle shaft (10) mounted on the upper bearing box (7), and another spur gear (20) is axially fixed to a side lever shaft (18) axially mounted on the lower bearing box (7) axially fixed to the handle side lever (11), so that the angular momentum can be 10 controlled by control of a gear ratio between the spur gears (19, 20).

5. The apparatus for three-dimensional anaerobic exercise according to claim 4, wherein the handle shaft (10) and 20 the side lever shaft (18) are axially mounted in parallel with each other, and the fixed lever (14) is fixed on the rear side of the base frame (2) to induce three-dimensional motion trajectories.

25 6. The apparatus for three-dimensional anaerobic exercise according to claim 1, wherein a shaft (21a) of a side of a cross joint (21) is axially mounted on the bearing (6) and a shaft (21b) of the other side of the cross joint (21) is axially mounted on the lower end portion of the handle linkage 5 so as to move the handle linkage (5) in all directions, and 30

an L-shaped connection lever (22) is axially mounted on an end of the front of the shaft (21a), and the lower end portion of the auxiliary linkage (12) is connected to the other end portion of the shaft (21a) with the ball joint (13a).

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7. The apparatus for three-dimensional anaerobic exercise according to claim 6, wherein fixing pieces (23, 24) are mounted on the handle linkage (5) and the base frame (2) respectively, and another auxiliary linkage (27) is mounted between the fixing pieces (23, 24) via ball joints (25, 26) so as to induce the three-dimensional motion trajectories of the handle linkage 5 using characteristics of the cross joint (21).

8. The apparatus for three-dimensional anaerobic exercise according to claim 1, wherein a shaft (21a) of a side of a cross joint (21) is axially mounted on the bearing (6) and a shaft (21b) of the other side of the cross joint (21) is axially mounted on the lower end portion of the handle linkage 5 so as to move the handle linkage (5) in all directions,

20 an L-shaped connection lever (22) is axially mounted on an end of the front of the shaft (21a), and the lower end portion of the auxiliary linkage (12) is connected to the other end portion of the shaft (21a) with the ball joint (13a), and

upper and lower bearing boxes (7) are mounted on the upper end portion of the handle linkage (5), a spur gear (19) is axially fixed to the handle shaft (10) mounted on the upper bearing box (7), and another spur gear (20) is axially fixed to a side lever shaft (18) axially mounted on the lower bearing box (7) axially fixed to the handle side lever (11), so that the angular momentum can be controlled by control of a gear ratio

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between the spur gears (19, 20).